

## TRANSMISSION LINE TO WAVEGUIDE TRANSITION STRUCTURES

### ABSTRACT OF THE DISCLOSURE

Disclosed are planar structures for coupling electromagnetic signals between planar transmission lines and waveguides. A preferred exemplary structure comprises a shielded patch antenna and one or more capacitive diaphragms disposed adjacent to the patch antenna. This structure is advantageous to MMIC modules in connecting from a planar transmission line of a substrate carrying an MMIC to an external waveguide without the need of a non-planar back metal short, which is normally essential to avoid back scattering from waveguide and also normally needed to achieve impedance matching. In structures according to the present invention, a patch antenna radiates into the waveguide while the antenna's ground plane reduces back scattering from waveguide.

5 The one or more capacitive diaphragms provide impedance matching between the microstrip and the waveguide.

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